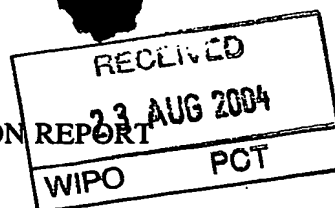


## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference 18001/5042	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US03/25230	International filing date (day/month/year) 13 August 2003 (13.08.2003)	Priority date (day/month/year) 14 August 2002 (14.08.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): B01D 61/20 and US Cl.: 210/637		
Applicant RENSSELAER POLYTECHNIC INSTITUTE		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 12 March 2004 (12.03.2004)	Date of completion of this report 06 August 2004 (06.08.2004)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Joseph W. Drodge Telephone No. 571-272-1700

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☒ the international application as originally filed.
- ☒ the description:  
pages 1-55 as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_.

- ☒ the claims:  
pages 56-75 as originally filed  
pages NONE, as amended (together with any statement) under Article 19  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_.

- ☒ the drawings:  
pages 1-22 as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_.

- ☐ the sequence listing part of the description:  
pages NONE as originally filed  
pages NONE, filed with the demand  
pages NONE, filed with the letter of \_\_\_\_\_.

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>1-79</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-79</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-79</u>	YES
	Claims <u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-29 and 71-79 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method for predicting pressure independent permeation flux and target molecule yield in a permeate resulting from crossflow membrane filtration of particles in a poly-disperse suspension by steps including determining packing density at a membrane wall for each particle size at a predicted permeation flux. Each of the Journal of Membrane Science publications of record in the Search Report include separate determinations of particle sizes and packing density or characteristics or parameters related to packing density, however do not suggest any correlation or relationship between particle size and packing density.

Claims 30-39 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method for determining packing density of particles of a poly-disperse suspension at a membrane wall, including determining interstitial packing density of particles in the suspension which are smallest, thereby determining packing density at the membrane wall of particles of the poly-disperse suspension. The Journal of Membrane Science publications of record in the Search Report include separate determinations of particle sizes and packing density or characteristics or parameters related to packing density, however do not suggest any correlation or relationship between particle size and packing density.

Claims 40-56 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method for predicting pressure independent permeation flux for crossflow membrane filtration of a poly-disperse suspension including determining packing density at the membrane wall for each of plural particle sizes at the predicted permeation flux for the suspension. The Journal of Membrane Science publications of record in the Search Report include separate determinations of particle sizes and packing density or characteristics or parameters related to packing density, however do not suggest any correlation or relationship between particle size and packing density.

Claims 57-70 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest a method for calculating yield of a target molecule in a permeate for a poly-disperse suspension during crossflow membrane filtration including determining minimum pore diameter of particles based on the packing density of each particle. The Journal of Membrane Science publications of record in the Search Report include separate determinations of particles sizes or pore radius or diameters and of packing density or related parameters, however do not suggest any correlation or relationship between particle size or pore radius/diameter and packing density.

Claims 1-79 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry. Claims 1-79 all recite methods which are useful in the research & product development branches of the membrane filtration sector of liquid purification industries.

----- NEW CITATIONS -----